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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,352	11/14/2001	Miyuki Kunitatsu	HITA.0121	6939

38327 7590 10/05/2004

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EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/987,352	KUNIMATSU ET AL.	
	Examiner	Art Unit	
	Sow-Fun Hon	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/24/04 has been entered.

Withdrawn Rejections

2. The 35 U.S.C. 103(a) rejections have been withdrawn due to Applicant's amendment dated 06/24/04.

New Rejections

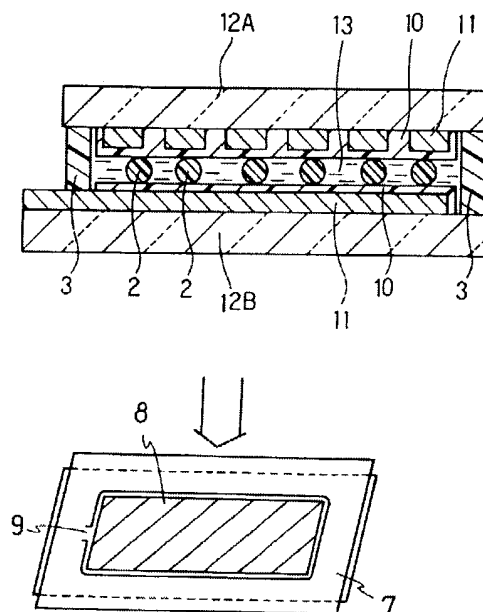
Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 5,898,041) in view of Morozumi (US 5,463,862).

Yamada has a liquid crystal display device comprising a liquid crystal panel in which a lower substrate 12A having transparent pixel electrodes 11 on its inside surface, and an upper substrate 12B, disposed in opposition to each other; with a layer of liquid crystal compound 13 being interposed there between; and the lower and the upper substrates are stuck to each other by

Yamada teaches an opening 9 in the liquid crystal cell 7, which is cut after main hardening of the sealing material 3 (column 11, lines 15-20), shown in the next figure below. Opening 9 serves as a liquid crystal filling port (column 11, lines 15-20), and is thus inherently an injecting port by virtue of its structure. Yamada teaches that opening 9 is closed to complete the liquid crystal display panel (column 11, lines 16-21).

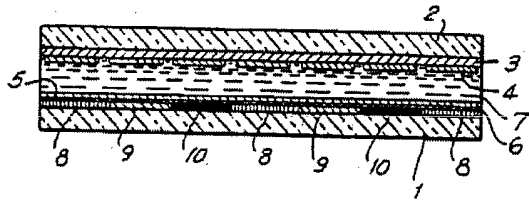


Although Yamada fails to disclose that the opening 9, which is a cut in the hardened sealing material 3 (column 11, lines 15-20), is sealed with sealing material 3, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have done so in order to made the seal around the liquid crystal cell, and hence the liquid crystal display panel, complete (column 11, lines 16-21).

Yamada teaches that the preferred components do not have interaction with the liquid crystal (column 10, lines 25-30) and that the elution (discharge) of the sealing material into the liquid crystal is prevented, if the curing ratio of the sealing material after the ultraviolet curing is at least 50 to 60 % (column 5, lines 35-40) with an accumulated light quantity (irradiation energy) of $4,800 \text{ mJ}/\text{cm}^2$ (column 17, lines 25-30), which is within the claimed range of $4,000 \text{ mJ}/\text{cm}^2$. Thus the amount of constituent components of the end-sealing material which elute as impurities into the liquid crystal compound is prevented and overlaps the claimed range of 1.0/10,000 or less of the total peak area value of the liquid crystal compound that is measured by gas chromatography/mass spectrometry.

Yamada, however, fails to disclose that the transparent pixel electrodes 4 are accompanied by thin film transistors for switching for pixel selection, or color filters in the display panel.

Morozumi has a multi-color liquid crystal display, comprising a liquid crystal display panel in which a lower substrate 2 having thin film transistors for switching for pixel selection (switching element layer 3 and transparent pixel electrodes 4) on its inside surface and an upper substrate 1 having color filters 8, 9, 10 for plural colors red, green and blue on its inside surface, disposed in opposition to each other with a layer of liquid crystal compound 7 being interposed there between, and the lower substrate and the upper substrate are stuck to each other by a sealing material (sealing around the periphery of the substrates) (column 3, lines 1-25 and column 4, lines 15-35). The embodiment of Morozumi, on the next page, should be viewed upside down.



Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to accompany the transparent pixel electrodes of Yamada with thin film transistor switching elements, and color filters, with plural colors, on the opposing substrate surface of Yamada, in order to obtain a multi-color liquid crystal display device, as taught by Morozumi, and a method of making it.

5. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Morozumi, as applied to claim 1 above, and further in view of Woods et al. (US 4,668,713).

Yamada in view of Morozumi has been discussed above. Furthermore, Yamada teaches that the sealing material comprises a (epoxy)(meth)acrylate group oligomer, a (meth)acrylic group containing monomer from a list of (metha)crylates such as 2-hydroxy propyl (metha)crylate and pentaerythritol tri(meth)acrylate. The photocrosslinked reaction (optical) initiator includes acetophenone type ultraviolet cure (optical) initiators such as 2,2-dimethoxy-2-phenyl acetone (column 16, lines 5-50) which is a homolog of 2,2-dimethoxy-2-phenyl acetophenone, Applicant's chemical formula (i) where there is an extra phenyl group on the acetone segment. $R_1=R_2=R_3=H$ (claims 2-3). The sealant material is heated and aged (annealed) at 120 °C for 12 hours (column 17, lines 25-35) (claim 4).

Yamada fails to teach the presence of a phenolic antioxidant in the sealing material.

Woods teaches a UV curable (title) sealing (sealant) material for electronic components (column 1, lines 5-10). The photoinitiators are the free radical ones well known for use in ultraviolet (UV-) curable systems such as the acetophenone types (column 6, lines 25-40). Woods teaches that the phenolic antioxidant (free radical stabilizer or inhibitor) is present to prevent premature offset of curing, and can be a hydroquinone or 2,6-Di-*t*-butyl-*p*-cresol (2,6-di-*tert*-butyl-4-methyl phenol) (column 6, lines 40-50).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to add a phenolic antioxidant to the ultraviolet curable sealing material of Yamada, in order to obtain a sealing material with controlled hardening, as taught by Woods.

Regarding claim 5, Yamada teaches that the preferred components do not have interaction with the liquid crystal (column 10, lines 25-30) and that the elution (discharge) of the sealing material into the liquid crystal is prevented, if the curing ratio of the sealing material after the ultraviolet curing is at least 50 to 60 % (column 5, lines 35-40) with an accumulated light quantity (irradiation energy) of 4,800 mJ/(cm²) (column 17, lines 25-30), which is within the claimed range of 4,000 mJ/ cm². Thus the amount of constituent components of the end-sealing material which elute as impurities into the liquid crystal compound is prevented and overlaps the claimed range of 1.0/10,000 or less of the total peak area value of the liquid crystal compound that is measured by gas chromatography/mass spectrometry.

Response to Arguments

6. Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 1772

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

09/30/04